

## MADEIRA (MACARONESIA)



### Current situation & main challenges

#### Socio-economic context

With a population density of about 323 inhabitants per km<sup>2</sup> (approximately three times higher than the Portuguese average), the Madeira archipelago is the most densely populated of the Macaronesia region. Over 40% of the population is concentrated in Funchal, the capital city of Madeira island<sup>(3)</sup>. Madeira's economy contributes with 2.4% to the national economy of Portugal, with a GDP per capita of 15,710 € (2014, prel. data)<sup>(3)</sup>, revealing a decreasing trend in the last years. The region's economy is dominated by the tertiary sector: favorable fiscal conditions have attracted many international finance companies. Besides, Madeira has been a tourist destination since the XIXth century and the tourism industry mobilizes nearly one million visitors per year (2014)<sup>(4)</sup>. The global impact of tourism sector in Madeira's economy is estimated at approximately 24% of GDP and over 15% of the total employment in the archipelago (2013)<sup>(5)</sup>. There is little industry, most of it related to the production of artisanal goods, such as embroideries. Agriculture (centred around bananas, flowers and wine production), forestry and fisheries represent 2% of the economy<sup>(3)</sup>.

#### Legal and political context

Madeira is an autonomous region of Portugal, situated in the Atlantic Ocean 660 km to the west of Morocco, which consists of two main islands (the Island of Madeira, which represents 90% of the land of the archipelago and the island of Porto Santo), other uninhabited islands (Desertas and Selvagens) and several small islets.

Besides the protected areas designated under a local framework (one nature Park, covering 60% of the surface of Madeira island, and 5 Nature Reserves), the archipelago has 16 Natura 2000 sites (5 Special Protected Areas and 11 Special Areas of Conservation).

In terms of Global Agreements, Portugal has concluded or ratified the main Treaties and Conventions on Nature and Biodiversity Conservation, such as CBD, Bern Convention, CITES, Bonn Convention and Ramsar Convention. Other policy instruments of direct importance for biodiversity of the archipelago are the EC Birds and Habitats directives and the Natura 2000 network, the Man and Biosphere program and the network REDBIOS.

### Facts & figures

#### Geography

Total area: 454,766 km<sup>2</sup>  
Land area: 802 km<sup>2</sup> (0.18%)<sup>(3)</sup>  
Protected land area: 463 km<sup>2</sup> (58%)<sup>(1)</sup>

Total marine area: 453,964 km<sup>2</sup> (99.82%)<sup>(2)</sup>  
Exclusive economic zone (EEZ): 442,316 km<sup>2</sup> (97%)<sup>(2)</sup>  
Marine protected area (MPA and/or MMA): 238 km<sup>2</sup> (0.05%)<sup>(1)</sup>

Overseas Regions (Governance/Dependency): PT

#### Socio-economic facts

Total population (2014): 258,686<sup>(3)</sup>  
Population density (2014): 323/km<sup>2</sup><sup>(3)</sup>  
GDP (2014, prel. data): 4,085 million €<sup>(3)</sup>  
Main income sources<sup>(4)</sup>:  
33%: Wholesale and retail trade; repair of motor vehicles and motorcycles; transportation and storages; accommodation and food service activities  
28%: Public administration; education; human health activities  
12%: Real Estate activities

#### Biodiversity

Threatened ecosystems: Laurel forest (laurissilva) w/ 150 km<sup>2</sup> (20% from the original 60% cover)<sup>(6)</sup>

Endemic species: 1,419 terrestrial taxa (1,286 spp & 182 ssp): 19% of total identified terr. taxa<sup>(7)</sup>

Land Molluscs (210) and Arthropods (979) comprise about 84% of the Madeiran endemics. Endemism within Molluscs reaches 71%<sup>(7)</sup>

Birds: *Pterodroma madeira*; *Pterodroma deserta*; *Columba trocaz*; *Regulus maderensis*. Arthropods: *Hogna ingens*; *Gonepteryx maderensis*. Molluscs: *Caseolus calvus*; *Actinella obserata*; *Discula lyelliana*. Plantae: *Geranium maderense*; *Euphorbia piscatoria*; *Echium candicans*. Mammals: *Nyctalus leisleri* ssp. *Verrucosus*. Reptiles: *Teira dugesii*; *Tarentola bischoffi*

Threatened species: 240<sup>(8)</sup>  
*Pterodroma madeira*; *Pterodroma deserta*; *Monachus monachus*; *Pipistrellus maderensis*; *Tarentola bischoffi*; *Caseolus subcalliferus*; *Discula bulverii*

## Current conservation status

### Threats and pressures on biodiversity

Having suffered extensive clearance after the islands were settled, Madeira's native vegetation is currently threatened by invasive species, mismanagement of pastures and grazing, and tourism development. During the last 500 years, most of the Madeira's forest has been destroyed through exploitation for agricultural purposes, ship-building, road building and urbanization. Today felling is strictly controlled and the main threat to forest is fire. The preservation of the largest extension of laurel forest still existing today in Madeira can be credited to the largely inaccessible mountain systems that cover such a large proportion of the island. Reforestation with non-native species, *Pinus pinaster* and *Eucalyptus globulus*, is widespread at mid-altitudes. In the more accessible areas, many sensitive habitats were severely altered, leading to the extinction of species. This occurred, for instance, in humid habitats of Southern Madeira (where *Rupia maritima* disappeared from brackish habitats and *Osmundia regalis* and *Dracunculus canariensis* vanished with the artificialization of riparian habitats). In the highlands of Madeira Island grazing was the main threat to the native vegetation, but a recent total ban (and previous restrictions) give hope to restricting the degradation trend. However, in August 2010, one major fire in Madeira Island destroyed an extensive area of the Central Massif, affecting a significant part of the fauna, flora and habitats of this region, with the possible extinction of land-snails' species endemic to the area.

A similar process took place in Porto Santo, which today is almost completely humanized. Overgrazing by rabbits and livestock has led to severe regression of the endemic flora also on Desertas and Selvagens, which in turn has caused coastal erosion.

Fossil records of molluscs and birds show that 9 terrestrial molluscs disappeared in the 600 years since human colonization<sup>(12)</sup>, and also that the archipelago of Madeira was inhabited by endemic birds (at least three flightless rails, two quails, a scops owl, and several passerines) that probably went extinct after human arrival.<sup>(13)</sup> Many arthropod species have not been found since they were described from laurel forests in the XIXth century. The Laurisilva area was much larger then that it is today, leading researchers to fear that some of these described but never seen again species may have in fact disappeared. The information available for the marine species and habitats is limited, but there are indications of impacts, including those related to intensive fishing.

### Current investments

- [Establishment of a Nature Park in Madeira island](#) which covers 60% of its surface (both the Madeiran Central Massif and all the Laurisilva area). In addition, 5 Nature Reserves were established in the archipelago.
- [Designation of a Biosphere Reserve in Madeira island](#) which includes the threatened Laurel Forest ecosystem.
- Accomplishment with the actual establishment of the Natura 2000 network, by designating 5 Special Protected Areas (for birds) and 11 Special Areas of Conservation.
- The entire remaining laurel forest ecosystem is protected (included in the Nature Park of Madeira island and on Natura 2000 sites) and classified as a European Council Biosgenetic Reserve since 1992, as well as a UNESCO World Natural Heritage site since 1999.
- [Development of several projects for the conservation of species and habitats](#), such as the more iconic ones described in this page.

### Critical areas for action / Investment niches

- Development of an online biodiversity databank (similar to the existing ones for the Azores and Canary Islands)
- Development of a RED LIST for the Madeiran fauna and flora, ideally following IUCN's recommended criteria for Red Lists.
- Creation of micro-reserves in areas of severely fragmented habitats.

## Important (ongoing) conservation activities

[Monk seal conservation in Madeira and development of a conservation status surveillance system](#): efforts for the conservation of the only surviving Macaronesian population of the monk seal, a CR species, started in 1988 and has been extended through several strategies. Currently, a new LIFE project, coordinated by Fundación CBD, aims to resolve known threats to the monk seal, addressing the conflict between its habitat needs and human activities in coastal areas.

**Budget:** 1,143,364 € (2014-2018)

**Activities:** locating, defining, and protecting the caves that are of interest to the monk seal; boarding fishing and maritime-tourism boats to reduce threats; via satellite monitoring.

**Results:** 1) From previous projects: creation of a Nature Reserve, specifically to protect the monk seal, which shelters 30-40 adults, 5-7% of the global population, from a low point of 6-8 individuals in 1980s; 2) Expected: an official Monk Seal Regional Conservation Plan in Madeira; increased capacity of the Nature Park of Madeira to intervene along the coastline to tackle threats or emergency situations; surveillance systems, indicators and baseline values for monitoring of the monk seal and its habitat; reduced threats and disturbances from fishermen, tourism operators, tourists and local inhabitants.

[Project "LIFE Macico Montanhoso"](#): Coordinated by the Government of the Madeira archipelago to facilitate the regeneration and conservation of the natural ecosystem (following a major fire in the Central Mountain Massif of Madeira island in August 2010), controlling and eradicating invasive species and reintroducing and/or reinforcing populations of the target species.

**Budget:** 1,225,022 € (2012-2017)

**Activities:** creation of seeds bank; plants production; eradication of invasive species and growing native ones *in situ*; conservation actions for endemic land-snails endemics to the area, in particular *Leiostryla Cassida*; conservation actions targeting Zino's petrel.

**Results:** Conservation programmes i) for the regeneration of priority habitats in burned areas and in areas dominated by invasive species; ii) of measures for species and habitats of Community interest with unfavorable conservation status. Increased knowledge on the ecology of endemic and indigenous species of Community interest.

### Useful links

[http://ec.europa.eu/environment/nature/biodiversity/best/index\\_en.htm](http://ec.europa.eu/environment/nature/biodiversity/best/index_en.htm)

<http://www.pnm.pt/>

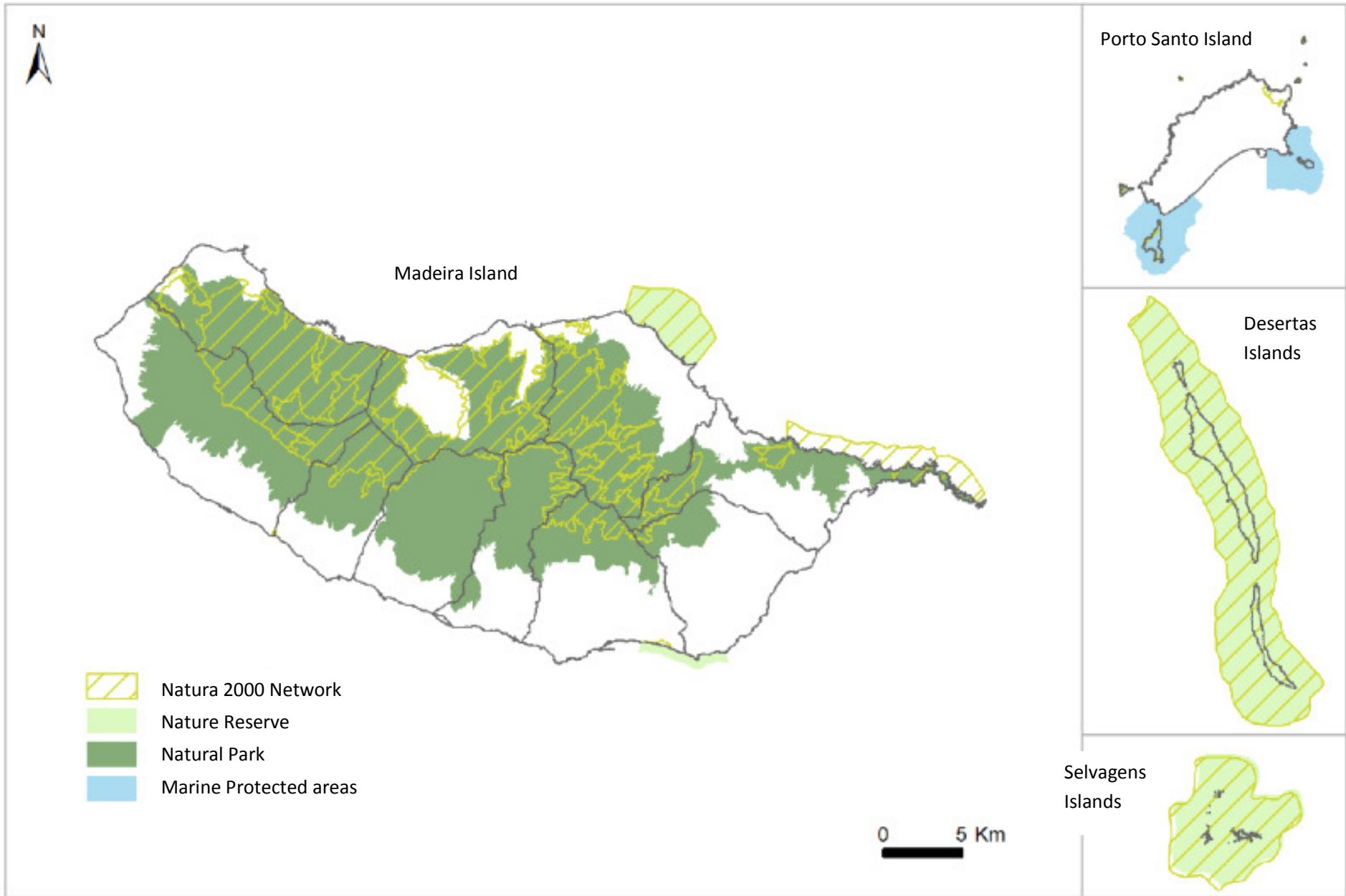
<http://biodiversidade.gov-madeira.pt/>



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# Madeira archipelago – Regional protected areas and Natura 2000 sites



## References

- (1) Own calculations based on data provided by the Government of Madeira Archipelago, Parque Nacional da Madeira (2014).
- (2) Ministério da Defesa Nacional – Marinha (s.d.). Portugal, uma nação marítima. <[http://www.marinha.pt/pt-pt/historia-estrategia/estrategia/folhetospt/Portugal\\_uma\\_nacao\\_maritima.pdf](http://www.marinha.pt/pt-pt/historia-estrategia/estrategia/folhetospt/Portugal_uma_nacao_maritima.pdf)>
- (3) DREM (2015). Anuário Estatístico da Região Autónoma da Madeira 2014. Direção Regional de Estatística da Madeira. <<http://estatistica.gov-madeira.pt/index.php/download-now/multitematicas-pt/multitematicas-anuario-pt/multitematicas-anuario-publicacoes-pt/finish/196-anuario-publicacoes/4946-anuario-estatistico-da-ram-2014>>
- (4) DREM (2015). Estatísticas do Turismo da Região Autónoma da Madeira – Resultados definitivos 2014. Direção Regional de Estatística da Madeira. <<http://estatistica.gov-madeira.pt/index.php/download-now-3/economic/turismo-gb/turismo-publicacoes-gb/finish/270-publicacoes/4162-turismo-2014>>
- (5) ACIF & KPMG (2014). Documento Estratégico para o Turismo na RAM (2015-2020), Dezembro 2014. Câmara do Comércio e Indústria da Madeira.
- (6) EEA (2002). Europe's Biodiversity - biogeographical regions and seas. <[http://www.eea.europa.eu/publications/report\\_2002\\_0524\\_154909](http://www.eea.europa.eu/publications/report_2002_0524_154909)>
- (7) Borges, P. A. V., Abreu, C., Aguiar, A. M. F., Carvalho, P., Jardim, R., Melo, I., Oliveira, P., Sérgio, C., Serrano, A. R. M. & Vieira, P. (2008). *A list of the terrestrial fungi, flora and fauna of Madeira and Selvagens archipelagos*. Funchal and Angra do Heroísmo: Direcção Regional do Ambiente da Madeira and Universidade dos Açores. <<http://cita.angra.uac.pt/ficheiros/publicacoes/1258117277.pdf>>
- (8) Own calculations based on IUCN & Portuguese Red Lists (Categories: CR, EN, VU):
  - IUCN (2015). IUCN Red List of Threatened Species. Version 2015.4. <[www.iucnredlist.org](http://www.iucnredlist.org)>.
  - Cabral MJ (coord.), Almeida J, Almeida PR, Dellinger T, Ferrand de Almeida N, Oliveira ME, Palmeirim JM, Queiroz AI, Rogado L & Santos-Reis M (eds.) (2005). *Livro Vermelho dos Vertebrados de Portugal*. Instituto da Conservação da Natureza. Lisboa. 660 pp. <<http://www.icnf.pt/portal/naturaclas/patrinatur/lv>>
  - Sim-Sim et al (2014). Bryophyte conservation on a North Atlantic hotspot: threatened bryophytes in Madeira and Selvagens Archipelagos (Portugal).
- (12) Goodfriend, G.A., Cameron, R.A.D. & Cook, L.M. (1994). Fossil evidence of recent human impact on the land snail fauna of Madeira. *Journal of Biogeography*, 21: 309-320.
- (13) Pieper, H. (1985). The fossil land birds of Madeira and Porto Santo. *Bocagiana*, 88: 1-6, and Rando, J.C., Pieper, H., Alcover, J.A. & Olson, S.L. (2012). A new species of extinct fossil scops owl (Aves: Strigiformes: Strigidae: Otus) from the Archipelago of Madeira (North Atlantic Ocean). *Zootaxa*, 3182, 29–42.